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PRACTICAL INSTRUCTIONS

FOR
THE CULTIVATION
OF
THE POTATO,

CONTAINING THE
COMPETITION ESSAY FOR THE PRIZE OF 1000 FRANCS
OFFERED BY THE BELGIUM GOVERNMENT.

ALSO
INSTRUCTIONS ON THE MANAGEMENT OF
ASPARAGUS, SEA KALE, RHUBARB,
VEGETABLE MARROW, SCARLET RUNNER.
STRAWBERRY, MELON, CUCUMBER;
THE TOMATO, OR LOVE-APPLE;
RHICORY AND LAMB LETTUCE AS SALADS;
THE LISIANTHUS RUSSELLIANUS,
THE TREE MIGNONETTE.
THE DESTRUCTION OF WOODLICE AND GREEN FLY;
AND
PEAT CHARCOAL AS A MANURE.

By JAMES CUTHILL,

Horticulturalist,
CAMBERWELL.

LONDON :

PRINTED FOR THE AUTHOR, AND SOLD BY HIM ONLY.

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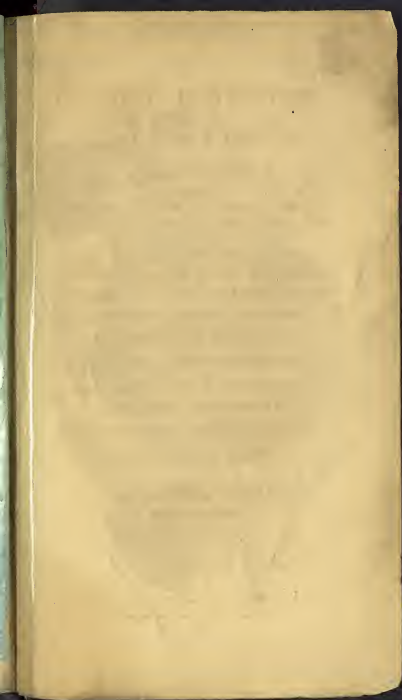
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THE LISIANTHUS RUSSELLIANUS.

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To the Memory of
THE LATE JAMES SMITH, Esq.
OF DEANSTON,

THE ORIGINATOR OF THOROUGH DRAINAGE,

AND

A GREAT PATRON OF HIGH CULTIVATION;

A TALENTED PUBLIC OFFICER,

AND

ESTEEMED PRIVATE FRIEND;

THESE TREATISES ARE AFFECTIONATELY INSCRIBED

BY

THE AUTHOR.

NOTE.

The results of some experiments tried on the Potato since the following was printed, are given at page 56.

PRACTICAL INSTRUCTIONS.

THE POTATO.

AFTER all that has been said and written on the subject of the Potato Disease, it appears that we are yet unable to give any satisfactory explanation of the causes which have spread it so widely and destructively during the last few years. It seems to be agreed that we must look upon atmospheric influences, of the nature of which we are able to give no account, as largely concerned in the production of the evil; yet, as I believe I can show in the following pages, improper modes of cultivation have greatly aggravated, if they did not even give the first occasion to, the destructive visitation which has fallen upon the plant. My object has been, from the outset of my experiments, to find a practical remedy for the evil; and my attention has been directed rather to the endeavour to give strength and power of resistance to the plant, by improved methods of cultivation, founded on general physiological principles, than to apply temporary or speculative remedies to the symptoms of the disease presented during the later stages of the growth of the crops. In this essay therefore I shall mainly dwell upon the practical part of the subject, with a view to the benefit of those engaged in the culture of the Potato.

Two years ago I published a short account of my mode of cultivating the Potato, and the following extract from the Preface will explain the main principle on which it is founded:

"It is quite true that nature often provides seeds and tubers with more nutritious matter than the young plants require; but this is evidently a provision to adapt

them to varying circumstances, or in fact, providing for the worst, and it seems to me that there is much danger in presuming upon such a provision. I would therefore strongly impress upon those cultivating the Potato, the importance of attending to the shoots from the tuber, which if *forced* (whether by careless exposure to heat and moisture, or otherwise), are weaker than if slowly developed, and will require corresponding care in their after culture; and moreover, of remembering that all superabundant shoots which they may have been allowed to develop, under the above circumstances, are so many drains upon the tuber, and a waste of that matter which has been laid up for the support of the plant in the earlier stages of its existence. It is clear that the more support a plant receives from the tuber, the stronger and more energetic will be its power to avail itself of the extraneous nourishment presented to it, and an economy of the resources of the plant itself is especially important in those half-ripened tubers, so deficient in starch, which the late disease has left us."

In the first place, I will give an account of the plan of culture I have followed with the most successful results for the last ten years, during which time my crops have never been attacked by the disease.

Having but a small piece of ground I never save my own sets, and therefore buy what I want every year, as early as possible in October, before the eyes have grown. I consider that the Potato should have a change of ground; those who have large farms may save their sets upon strong soil, and plant them next year on a lighter, and so on. When this cannot be done, farmers may exchange sets with each other, and the same plan is open to cottagers and others.

The sets are well greened in the sun and then laid out singly (with their heads all one way, to preserve order at taking-up time when planted out) under a stage in a cold greenhouse. Of course, all persons will not have such a convenience, but market gardeners may fill their "lights," putting the glass on and covering up accordingly as the winter advances. If they cannot spare frames, trenches may be dug; one 5 feet broad and 100 feet long will hold enough Potatoes to

plant an acre of land. Farmers may find room in lofts, sheds, trenches, or other places; for cottagers a very small corner will be sufficient.

Care is taken that no water fall upon them, and nothing more is done until about the middle of January, by which time the shoots have grown about an inch. The shoot is very strong and green, the young fibres striking out from the base of the shoot and very bold and strong. I now put on as much mould as will cover them, and one watering is given to mix the earth in between them.

They are left then untouched until planting out time; they are not even watered, because the less water given to them the harder and more wiry they become, sending out an immense number of roots to collect food; in fact, when taken up in the middle or end of February, they have produced a complete mass of strong, fine roots, with a powerful stem.

The ground is prepared during the winter by trenching two spades deep and laying it in ridges. The ridges ought to run north and south, this being of the greatest consequence, in order to allow of an equal action of the sun and air on the sides. Early Potatoes should be planted in ridges from 18 inches to 2 feet apart, and the sets be placed at intervals of 9 inches; late Potatoes ought never to be planted closer than 2 feet to 2 feet 6 inches from row to row, and 1 foot from set to set.

As soon as the ground is trenched I sow salt and soot, in the proportion of about 2 tons of salt and 30 bushels of soot to the acre, (I have used no other manure than this for five years.) The planting is commenced by taking up the sets carefully and placing them in the bottom of the first furrow,* the shoots being placed parallel with the ridges. The mould of the first ridge is then laid over them carefully, as the shoots are by this time 3, 4, or even 5 inches long; the next ridge is proceeded with in the same way and

* If all the side shoots are removed, leaving only the main shoot, the crop will be ripe or fit to dig nearly a week before the tubers with all the shoots attached, although the crop will not be near so heavy.

so on, the ground being left at last in ridges lying directly over the sets.

When the plants come up they grow so fast that they smother the weeds if there be any. If May should be very dry as in some seasons, I am obliged to water, and when I do, of course I continue it twice a week until rain comes; for if watering be not continued you only bring up the fibres to be killed by the heat of the sun.

The main points in the above mode of management are, that the Potato is not allowed to shoot and waste its substance in growth to be thrown away; the first shoot or bud is allowed to proceed onward to its perfect development, while in the common method of proceeding, the tubers are allowed to sprout from all the eyes, to produce a quantity of weak watery shoots, which are broken off and wasted at planting time, leaving the impoverished tuber in a condition which necessarily retards and weakens the future plants.

I have already stated that my crops of Potatoes have never been attacked by the disease, while it was committing its ravages on all around; and I may add that until I published an account of the above mode of culture, I could undersell all growers of early Potatoes in the London Markets; since I made it public, the price of early Potatoes has diminished one-half.

The following observations and experiments are given as illustrations of benefits resulting from the new mode of culture.

1. Four rows of old sets, which had produced an excellent crop in 1848, were wintered on my plan and planted out in February 1849; they produced a very superior crop, but the two years old tubers were then quite exhausted. This experiment was made to show what the tubers are capable of when carefully wintered.

2. Four rows of a late Kidney Potato, were wintered upon the above plan; the smallest set weighed half an ounce, the largest one ounce (all *whole* tubers, for I do not in any case approve of cutting up the sets). Stakes were inserted down the centre of two rows when the plants were about a foot high; the

halm was supported on each side by string. Another string was added when the plants had grown to eighteen inches. The whole of the leaves were then stripped off up to about one foot from the ground; this was done, in expectation of a wet summer, to allow the sun and air to act freely upon the surface of the soil. The other two rows were not tied up, but allowed to grow naturally, but the lower leaves were also removed from them. The summer turned out very dry and none of the plants were affected by disease, but the two rows which had been tied up yielded the best crops. From these facts I concluded that as a general rule it was not necessary to tie up the halm, but that it was advantageous to strip off the lower leaves at about the time when the plants are coming into flower, since in case of a wet summer the sun would act more directly upon the soil. The disease generally attacks the lower leaves first, probably on account of the mass of foliage keeping the surface of the earth damp and cold, in which case the lower leaves become unhealthy and the tubers are placed in the same condition as if growing in a cold, damp cellar. The leaves may be easily picked off by women and boys in a large plantation. The above four rows were grown upon the ridge system which I have practised for twenty years; it gives twice as much air, twice as much surface, heat and protection against rain, double depth of mould, and keeps the surface dry and warm by good drainage.

The flat system is quite unnatural, for it is unreasonable to plant a Potato upon a flat surface and after allowing it to grow a foot high, to draw earth over the stems and leaves. In such a case the plants must be kept back and weakened, for some weeks must elapse before the stems become blanched and throw out the Potato *strings*.

3. Growers upon a large scale may practice the ridge system in the following manner.

First ridge up the ground, then having a number of planters along the line, let them place the Potatoes in the bottom of the furrows. The plough should then be carried along the line, halving the ridge and throwing up the earth on each side so that the Potatoes will be

left in the centre of the new ridges. When the halm is 4 or 5 inches above ground, a small plough should be sent through, taking down the ridge to within 4 inches of the plants on each side, and another plough following should mould them up again. In this manner all the weeds will be destroyed and the growth of the Potatoes be quickened; but the ploughing must be done *before* the tuber *strings* have grown out from the stem. This method would not only ensure a much earlier crop of Potatoes, but would clean the ground for any other crop.

4. On the 1st of August, 1848, I had a border planted with sets ripened in the same year and which were well greened before planting. They grew very strongly and rapidly until they were killed down by the frost. I planted them in order to see if they would become diseased, but they escaped entirely, which goes to prove that the plants only catch the disease at a certain period.

5. In February, 1849, I removed the shoots, with the mass of roots from a tuber which had been wintered on my plan. The shoot was planted and flourished well, ripening its tubers as early as those plants to which the tubers remained attached. The divided tuber was also planted at the same time, but was a month later in ripening, since it had to make new shoots and roots; but it was ripe *just as soon as those seed Potatoes which had been wintered on the old plan and had been picked over two or three times* during the winter and spring, as has been too long the practice.

6. I do not recommend cutting off the stem when out of flower; I have tried it and found that the same kind of Potato grown on the same ground produced very inferior tubers when so treated; they contained very little starch, while those left to nature were very mealy.

7. The four rows of late Kidney Potatoes mentioned above were planted out about the middle of February, and were quite ripe by the middle of August. It is quite extraordinary how fast healthy and well-rooted Potatoes will grow; I have laid bare the tubers when one inch long, and six days after examined them again

and found the length doubled. I believe that what are called late Potatoes are made a month later in ripening by mismanagement. The plants are injured in constitution by being heavily covered with straw and mould, sweated and caused to grow, and the shoots are pulled off two or three times, wasting what nature provides for their future growth. Some growers do worse than this: they cut them up into sets, and expose them to the air to harden the wounds; and others even cut out the eyes with a small piece attached, and throw the mass of the tubers to cattle and pigs, so that the young plants are not allowed their fair proportion of the already half-exhausted store of nourishment.

8. I have tried the plan of keeping setting Potatoes in heaps, with certain precautions. The tubers were heaped up on the surface of the ground in the usual manner, in the form of a ridge; but instead of covering them closely with mould and straw, I had some hurdles placed about one foot above the tubers, and then thatched these over with straw, leaving a hole for cats to go in and catch mice. As the winter advanced I added more straw. By this simple plan all sweating was prevented and the tubers showed little signs of growth until the time of planting in February. I tried this experiment to prove that however large the establishment, my method might be carried out with advantage. A trench at least 18 inches deep must be carried all round the heaps, to carry off the rain and to keep the surface of the ground on which the Potatoes lie well drained.

9. All setting Potatoes should be kept as dry as possible, and they cannot be kept too cold; as much air as possible, and even light if practicable, should be admitted to them, as they are thus kept from growing and wasting their strength at an improper time. When the seed Potatoes are left upon the ground to become green, after digging up, the tendency to winter growth is much diminished.

10. In 1848, the disease travelled northward and westward, as the sun gained strength, although *not shining on the earth*, as the atmosphere was damp and cloudy. The Potato plants grew luxuriantly, and the stems and foliage were full of watery juices; the richer



and more retentive the soil, the more luxuriant was the growth of the plants. Very suddenly the weather became clear and a very hot sunshine came over the country. The plants were scorched, and probably the breathing pores became obstructed or destroyed by the rapid exhalation; the fluids of the plant being thus prevented from diffusing themselves in a natural manner, fermented and became diseased. It has always been noticed that the disease appears in the night after a hot sultry day, especially if the next day prove wet. The halm is observed to putrefy, the lower leaves going first, being previously in an unhealthy state, and more exposed to the steam which the hot sun draws up from the soil on the previous day. The tops are always the last to fade, being drier and more exposed to the air, but they go at last, from the general circulation being stopped.

The disease has not attacked the crops in general since 1845 in dry, hot and regular weather, and in the native condition of the Potato, the climate is regular, and the surface of the earth dry and warm during the period of growth.

This year (1849) the disease did not break out in the south of England until the 10th of August, although the nights had already been cold and sometimes frosty, but there was plenty of sun during the day. About the 10th of August, we had some cold, wet weather, and directly afterwards some hot bright sunshiny days. The disease then showed itself in the lowest and dampest situations.

11. Some have supposed that the disease is absorbed by the tubers from the atmosphere, because those nearest the surface and farthest from the parent stem are the first to catch it. This is easily explained in another way; the tubers nearest the surface are generally the last formed and most unripe, and in a wet season are in the coldest situation, under the dense foliage; besides the descending diseased juices flow more abundantly to the young tubers than to those more advanced, and when the tubers are very forward before the disease appears, they are comparatively little affected.*

* In buying seed Potatoes for my own planting, I have

12. All plants are liable to disease, according to their kinds and under peculiar weather, such as when the sun breaks out clear after a long continuance of dull, wet, cloudy weather. The sap cannot then evaporate fast enough from the gorged tissues, and decomposition takes place. In some plants mildews result, in others such as the Potato, fungi attack also the cellular structure within. After long continuance of damp cloudy weather, the halms often exhibit rusty spots close to the ground, showing the unhealthy condition of the juices flowing from the lower leaves; but this will not go on to the regular disease, unless a hot sun comes to ferment and decompose the juice. I have dug up a few roots with tubers attached, and left them exposed upon the ground; but the tubers did not become diseased, nor did fungi appear upon the halm, since the plants died at once here without any fermentation. In the usual cases of the disease the injury is only sufficient to render the sap unhealthy, this unhealthy sap then spreads to all parts of the plant before it dies, and thus the tubers exhibit the disease.

13. It is a well-known fact, that buyers of Potatoes in the spring season cut a piece out of the string end of the tuber to see whether it is getting black. This blackness is caused by the winter growth, drawing the starch away from these parts and leaving the cells empty. Until this autumn I have never noticed this blackness before growth; the appearance of the black spot so early as November can only be accounted for by imperfect ripening, the leaves having died before the cells of the tubers were filled with starch.

14. "Mealy" and "waxy" Potatoes may be known by the growth of the eye. The mealy Potato sends out a slender shoot containing little water; the waxy tuber sends out a bold, stout, but watery shoot. Waxy

always found diseased ones amongst them; they were laid by by themselves and treated according to my plan, the top eyes generally being safe, they produced as good a crop as the others, with no disease; I decidedly object to seedlings, in an ounce of seed they all vary, some early and some late, some large and some small, they neither eat alike nor keep alike.

Potatoes are such as have been taken up before ripening or have been allowed to grow during the winter.

15. It has been noticed that Potatoes after having been stored up some time catch the disease. This merely results from imperfect ripeness, the Potatoes are then unable to resist the decomposing agencies of heat and moisture to which they are exposed.

16. COOKERY.—Never buy Potatoes that have been washed many days and exposed to the air. Never peel them before boiling, as a large portion of the substance is thus lost; but before boiling make an incision all round through the peel, and another cross ways; this allows the steam to escape and makes the Potatoes mealy; if it is not done and the skin does not crack, they will be waxy.

Suggestions that occurred to the Author, and that were put to the test of experiment after the above was written, and dispatched to Belgium.

A few rods of ground were planted with small tubers of a late kind of Kidney, wintered upon my plan. This famous sort was presented to me by a Clergyman in Yorkshire; it came up very strongly, but the severe frost on the 10th of May cut the halm level with the ground. Every joint sent up fresh shoots, which if left would have weakened the roots. On the 28th May I pulled up all the weakest shoots, leaving only three or four of the strongest. I found on pulling the shoots up that they had several fibres: an idea struck me that if planted they would produce a crop. I planted a row of the shoots with a dibber, 6 inches plant from plant, and 6 inches deep. I dug up a root on July 28th, three nice Potatoes were attached to it, weighing together 8-oz., just two months from the time of transplanting. They had the disadvantage of being planted out during the very hot weather. The halm in the row is strong, but not crowded. The transplanted ones will stand a better chance of escaping the disease on account of having few roots; consequently not so luxuriant, and allow the air to act upon the surface of the soil. The lower leaves are green and healthy, while the rows with crowd-

ed and dense foliage are all yellow below. This idea may lead us to adopt the sprouting of the sets and pulling the shoots off, transplanting as we do beet, mangle, or swedes, or cabbages, only the shoots ought to be 6 inches long, and just keeping the head above the surface; but if the land is light, the head being placed an inch below the surface will be all the better.

Had those late Kidneys which I have experimented upon, when transplanted, been planted out a month earlier, they no doubt would have been now (July 28) quite ripe and past all danger of disease. This plan might incur too much trouble for many, but any plan to preserve them from disease, even if we get a small crop, must be better than losing all, until these extraordinary seasons shall have passed away, and the Potato recovers its usual health. The piece of Potatoes mentioned above was taken great care of during winter, and planted as an experiment, in order to show that a late Potato could be ripened by the 1st of August, and so they would had the frost not thrown them back a month.

Every Potato Grower knows that after the shoots produce roots, the tuber is of no further use, therefore if by timely sprouting and timely planting we could ensure a fair crop, the plan might save a deal of trouble, the land being clean and in good order at transplanting time, all in *ridges*, no further ploughing and hoeing would be required, till the crop was ripe; for it appears that many of our tender foreign introductions are becoming diseased, such as the Potato, the vine and the ridge cucumber. This makes the fifth or sixth year in which cucumbers have failed round London, in the open ground. A melon or cucumber grower knows, or ought to know, that if he water his frames too much in dull weather and over gorge the plants, that when dry hot weather sets in, in a few days afterwards, they will have "the canker," and very often mildew; but if he had refrained from watering and shaded in hot sunshine, to give time for a regular evaporation and elaboration of the sap, these diseases would not appear. My forty-eight lights of cucumbers had not one drop of water this spring until they were in full bearing; the

mould was very wet when put in. All greedy feeding foreign plants are liable to disease, according to their kind in such seasons as these; the sun has as much power in injuring the pores and the sap vessels after wet and sunless weather, as frost has in bursting them in winter. I have this year in practice another experiment with the above late Kidneys, viz. I have cut down every alternate row. This will stop any further swelling of the tubers, but it will save them as well as allow the next row more sun (if any) and air, thereby giving it a better chance of escape from disease by keeping the foliage in a more healthy state.

Some twenty years ago a gentleman whom I then lived with, bought what were called *Dutch Winter Potatoes*, they were to be planted in the autumn and to grow all the winter; the imposters charged a Guinea a peck for them; it was a round Potato, they were planted according to directions, but when the frost came, away the unfortunate tops went like all others; this very plan is now practised for Covent Garden Market; the old tubers are kept back until July, and then planted. They grow very fast, but they are not near ripe by the approach of frost; as soon as the halm is cut down, large quantities of straw is put on the ground, and towards Christmas the tubers are dug up, and put into one and two pound baskets, and are sold for new Potatoes, at from six-pence to eight-pence per lb.; they are as full of water as a turnip, the leaves being all destroyed before the cells had time to become filled with starch; the Cornwall Kidneys are the only ones used for this purpose; by taking one in your hand you will find the skin firm on, which is not the case with a new Potato, either grown in frames or in the natural ground.

If growers of the Potato will continue to cut the tubers into sets, all the crown sets ought to be kept together, and the bottom eyes planted by themselves; for the sap of all Potatoes rises to the crown eyes first, and when cut and planted indiscriminately, after a mild season, the crop is alternately good and bad, i.e. the sap is so much abstracted from the lower eyes by the top ones, that the former either push weakly or not at all.

ASPARAGUS.

THIS King of Vegetables is in great demand among the higher classes and more opulent tradesmen ; but the poorer tradesmen and working classes can only "look and admire" it in the shops. Although a native of Britain, many do not even know the taste of it, owing to the expensive way in which it is produced, and the expensive nature of the land in which it is grown round London. Now there is no good reason that I know of why it should not be obtained at a less cost and sold at a less price. Why should not some spirited gardening farmers establish a few fifty-acre fields for its growth? An eligible site for them could be easily found along the lines of railway, choosing a deep sandy, loamy soil, but not tenacious clay, for the purpose. A soil of this description would be rich in itself, and would not require so much manure as very light sandy soil would do, and in which it is now generally grown. The light soil gets lighter every year, on account of the manure put into it; but good loamy soil would produce Asparagus to pay at less than half the price it is now sold for in the London market, and every class would then be able to partake of it the same as any other vegetable.

To establish a field of Asparagus, spade labour must be resorted to, clearing out most carefully *couch*, *bindweed* &c., and using the strongest and best manures, as night soil, cow dung, salt, stable and other manures. Sewerage water would suit perfectly, if it could be had and applied in the growing season, and when the plants are in bearing; it might also be applied after the crop is cut, for that is just the time when the roots are most in want of a stimulant to form a mass of fine buds for next year's cutting. The field ought to be well drained, all drained land being warmer, earlier and much more productive than undrained; and otherwise well prepared in Autumn, before the heavy rains of winter set in. It should be trenched three spits deep if possible, the last spit forming a ridge, which would be well pulverized by the frost. In March those ridges should be levelled down, and the ground laid out for planting.

As it is my intention to discountenance the production of long white drum stick *Asparagus* as much as I can, I beg leave to advocate the following plan, by which in time every row will form its own bed. I propose that each row be planted three feet distant from the other, and that each plant stand one foot apart in the row. This will give ample room for cleaning the crop, and for drawing up earth over the crowns, so as to form a ridge 3 or 4 inches deep, to be lowered again for the purpose of enriching the soil in the autumn and winter. By this method I consider that *Asparagus* might be cut at least ten days earlier than it is by the plan now practised of burying the roots deep in a bed of earth, where sun and air cannot act upon them; and as for flavour, it has long been proved that although Gentlemen's Gardeners do not grow *Asparagus* so large as the Market Gardener, of the two it is by far the finest in flavour, with at least three times more eatable matter in each head, though only two-thirds the length. I have had *Asparagus* sent to me from Brussels, all blanched together a beautiful creamy white, but when cooked, I could not discover the taste of *Asparagus* in it. It was watery and insipid, as highly blanched *Asparagus* must always be, having only the watery flavour of the roots. I have proved this years ago, by keeping it in frames shut up, and the glass covered over with mats to exclude light.

I imagine that I have said enough to explode the old-fashioned and expensive plan of growing this much esteemed British vegetable. Some imagine that unless the roots are covered during winter, the frost will kill them; if roots are moved during winter, the wet will rot the injured fibres, and no Gardener who understands anything of vegetable physiology would think of lifting the roots for planting until February or March, unless for forcing, and the latter are put into heat at once; but *Asparagus* is perfectly hardy. The plan of putting large quantities of manure on it during winter is nevertheless good; for the winter rains wash the strength of the manure down amongst the roots. I should give the ground a good salting annually in February, and when cutting is discontinued in June, I

would *soak* with manure water, or town sewerage water better still, or even spread on dry artificial manure, for the heavy rains will soon wash the strength of it among the roots and just at the time when the latter were making fresh crowns for next year's crop. This is no doubt the proper time to manure Asparagus. If the above method of cultivation is adopted, I doubt not that its benefits will soon be discovered not only in the shape of improved "grass;" but also by the consumer. I believe that it is impossible for the grower to alter his mode of culture without the assistance of the consumer, and I am sure that by the plan I have just been advocating, the drain on the roots will not be half so much as it now is, owing to the fact of the latter having to form such a quantity of underground sticks ultimately to be thrown away. Wherever it is practicable asparagus ground should slope to the south or south east, and the rows should always run south and north. Where the land is light, ploughs might be used in throwing up the ridge on each side of the row, and then it could be forked over. The chief labour and expense will be in cutting and sending it to market, which will form employment for the people in the neighbourhood. In order to prove what the exclusion of air has to do with not only the flavour, but the hard or woody texture of the stem (under protracted growth), I had several heads of Asparagus just out of ground covered over with long Cucumber glasses, and all air excluded. When the stems reached the top they were cut and boiled; but they were so hard that not even the top could be used, proving at once that without plenty of air, the stem gets tough and useless. The present plan of making Asparagus beds round London, consists in putting on an immense quantity of manure and trenching the ground three or four feet deep, mixing the manure as the work proceeds. In March the ground is measured out after the following manner:—suppose that a fence runs south and north or otherwise, three feet is allowed between it and the first row; a drill is drawn about two inches deep, the seed sown thinly, say six inches or a foot apart, that gives choice of drawing out the weakest in order that

the permanent crop may stand one foot apart. The next row is sown eighteen inches from the one just mentioned; then for the alley and two sides of the bed five feet are allowed; then another row of seeds and so on, that gives two rows to each bed. The first year onions are generally sowed all over the ground, the second year, lettuce or any dwarf growing vegetable that will not choke the Asparagus, and so on, until the third year when the beds are formed out, and a few inches of mould dug out of the alley and put on the crowns; but only a few of the finest heads are cut this year. Autumn arrives, and when the halm is cut the whole of the ground is forked over, and planted with cabbage, coleworts, or winter greens; then in spring the beds are largely supplied with mould out of the alleys, covering the crowns from eight to ten inches deep. The finishing of the cutting must be left to the Grower. A fair crop of heads must be left after four or five weeks' cutting, in order in some measure to strengthen the young buds for the next year's crop, and to restore to the roots what has been taken from them in the shape of a crop; but not one head must be allowed to grow until you leave off cutting entirely at the end of the fourth year. When the halm gets ripe it is all cut down, and the mould thrown into the alleys and there enriched, and the whole of the beds and alleys are planted again with cauliflowers, &c. Such is the treatment which the London Market Gardeners give Asparagus; but the plan which I have practised for these twenty years, is as follows: As soon as the dead halm is cut down in autumn, I give the beds a good dressing of rich manure for the winter, salting them in spring and covering the manure with mould, to prevent evaporation. The rain carries down the strength of the winter covering to the roots,—and when spring arrives it might be raked off into the alleys, leaving only mould enough on the beds to protect the roots from the summer sun. We have then Asparagus, green, and eatable almost to the very root. The Rev. George Wilkins, of Wix, proved that by the above management he cut Asparagus much earlier and in much greater abundance with much finer flavour,

than by the deep covering system, see the "Gardener's Chronicle," of the 12th of May, 1849. Sea-weed makes the best manure where it can be had for *Asparagus*. Perhaps the finest *Asparagus* I have ever seen was at Ipswich; the beds were at the bottom of a garden where the river Orwell runs past; during the winter this river overflows its banks and some five or six weeks these beds are partially covered with water. This no doubt left a rich deposit; but the best time to irrigate would be in the growing season. The roots of *Asparagus* are largely provided with fibres, evidently formed to take up much water and my flat system would facilitate the irrigation system much.

SEA-KALE.

SEA-KALE is another most wholesome and delicious vegetable; but owing to the expensive ground in which it is grown as well as the costly management, the middle and lower classes seldom or never taste it. I shall not describe the present way of managing it, for that is well known; but I shall proceed at once to detail a plan that will supply the London Markets at a time when other vegetables are scarce. When we reflect that this is also a native of our sea coasts, it is very hard that we should have to pay a shilling for a moderate dish of it, and that too in the month of April. This vegetable, the very reverse of asparagus, unblanched is wholly uneatable. I would purpose that acres of it be planted near the various lines of railway, choosing for them a rich deep loamy soil, sloping to the south. The ground ought to be well drained, which at all times makes 4° or 5° difference in its temperature, and then trenched at least two spades deep, previously putting on a good dressing of dung. Salt could be put on (two tons to the acre would not be too much) every February. Supposing the ground to be ready for plants by February, and a large stock of roots that had been sown in the previous spring at hand, take up the roots and cut off the head or eye; then cut up all the roots into

lengths of three or four inches, taking care to know which are the top ends; for if this is not attended to, and the lowest part is planted upwards, the eyes when they grow would have to take an opposite direction and would not make so fine plants. The reason why Market Gardeners get so fine Kale is owing chiefly to their not allowing more than two buds to grow on a plant at thinning out time in spring; Gardeners in general leave five or six. Market Gardeners all force Sea-Kale; the roots after cutting the Kale are carefully kept till spring; they are then cut into pieces and planted out into rows to grow into good plants for the next winter's forcing. Upon my plan the rows should be three feet apart, and one foot plant from plant in the row. The reason why three feet is allowed between the rows is to give fair space for the Kale to grow in, as well as for an intermediate crop, which I expect will pay for the expense of the Sea-Kale. A single row of kohlrabi, mangel wurzel, swede turnips, or cow cabbage, would not shade the Kale too much, and in the autumn when the temporary crop is removed and the Kale leaves getting yellow, the leaves might then be taken off the crown to the centre between the rows, there to be dug in along with the manure. This would enrich the centre for the next year's intermediate crop.

The process of blanching and the means of accomplishing it form our next consideration. The cheapest and most efficient plan is with pots, not those half-crown pots, with a lid made to fit them and other costly apparatus; but another kind of pot which I purpose to have made for the purpose with no holes in it at all; rather rounded at top, a foot high, and a foot in diameter. They could be made for about six or eight pounds a thousand. Pots thus made would be much cheaper, than covering the crowns over with mould in the centre. In the first place, land for Sea-Kale must not be too light unless it is very deep, and if heavy it would be wholly unfit to blanch the heads in; besides all Kale must then be washed, which would spoil it. Sea-Kale ought never to be wetted until cooking time. Its roots are often much destroyed by wire-worms, but a good salting and application of soot, would stop them

from breeding, and in time would eradicate them. The length of time the old roots ought to occupy the ground ought also to be entirely altered. Gentlemen's Gardeners in general, look upon a piece of Sea-Kale when once made to last for ever; not so the Market Gardener; he is always first in everything, because he has to make the best of everything. Who has not seen in private gardens plants growing in summer, some two feet apart, some four, and some rows entirely gone all in the most irregular manner. The process of lifting the roots for forcing would soon alter this, and by following the above methods, large supplies of this most delicious and much neglected vegetable would be obtained; and all classes, and at a time when other vegetables are scarce, would be enabled to eat it. Sea-Kale being hardy would be forced a little by the sun acting upon the earth; the pots would retain the heat and bring it on much faster than if it were covered with mould, and, I am quite certain that the crops would pay much better than grain, or root crops; but it must be borne in mind, that for late crops of Kale or asparagus either, ground sloping to the north would make it ten days later, and as for the old plan of putting on large quantities of leaves mixed with dung, it ought at once to be given up, being not only unsightly but expensive and inefficient, boiling the plants in the centre, while the outside row was quite cold. Propagate roots every year; take them up when wanted and put as many as you want into a frame with a very little bottom heat. Pots could be used for it, either in a small or large way, by putting two or three roots into a pot—a plan I have followed in the blanching of chicory. I would simply take up the roots, plant them in the pots, and reverse the next smaller size over the crowns, stopping up the holes with a piece of clay, watering the roots, and then placing the whole in a moderate heat. By this means a much better succession of Sea-Kale could be kept up than by employing cart-loads of unsightly fermenting manure. As the Kale is cut lay the roots into a damp mould until March when they can be cut into sets and again planted out for another crop for next winter. When the sets begin to grow round the

edge of the top let them be thinned out to two eyes. Five years is the utmost length of time a permanent plantation ought to be allowed to stand. One or two good soakings of manure water, or sewerage water better still, just after the crop was cut, would make the heads as big again for another year.

R H U B A R B .

MR. JOSEPH MYATT, of Deptford, a kind and most benevolent man, now upwards of seventy years of age, was the first to cultivate Rhubarb on a large scale. It is now nearly forty years since he sent his two sons to the Borough Market with five bunches, of which they could only sell three, so little was the value of this excellent vegetable then known. The other two bunches they brought home with them. The next time they went to market they took ten bunches with them, all of which were sold. "Coming events cast their shadow before them," and from the small but increased sale, Mr. Myatt judged, and rightly, that Rhubarb would become a favourite. He therefore determined to increase its cultivation, and year after year added to his stock; the demand for it was augmented in an equal ratio. For his first dozen roots he was indebted to his friend Mr. Oldacre, who was then Gardener to Sir Joseph Banks. They consisted of a kind imported from Russia, finer and much earlier than the puny variety cultivated by the Brentford growers for Covent Garden.

It is reported of Mr. Rivers, that when he first began to speculate largely in rose growing, his old foreman, long since gone to his last resting place, came one day, with a very grave face, and said, "Master Tom, you are *surely* out of your mind: what *are* you going to do with all those brambles? It is a shame to plant them on land that would grow standard apples!" So it was with Mr. Myatt and his extensive Rhubarb planting. When one of his sons said in market one day that his father intended to plant an acre next year, they said, "Your father, poor man, is fast taking leave

of his senses." Like Mr. Rivers and others of a "go a-head" turn of mind, Mr. Myatt had to contend against many prejudices; but time, that "universal leveller," overcame and broke down every barrier, and Rhubarb is now no longer called physic as it was then. In our own day, it forms most delicious and wholesome tarts and puddings, as well as an excellent preserve; and as we have sugar and flour so cheap, any system of growing this useful "vegetable fruit stalk," as it may be called, earlier and more plentiful during the winter than it is at present, must prove a benefit,

By the plan I am now about to propound, I think Rhubarb might be had fit for table at least five weeks before the London growers could obtain it out of doors. But in the first place, let me premise that there is a wonderful difference in the sorts as to earliness and quality. Myatt's Linnæus and Mitchell's Royal Albert are the earliest and the best flavoured, and wherever any of the other rougher sorts exist, they ought to be done away with at once; for there is as much difference between the flavours of Rhubarb as between a ripston pipplin and a codlin apple. Besides, we want every thing early, and as Rhubarb is so easy of carriage, what reason can there be why Cornwall and Devon should not furnish it in large quantities, as they now do the London markets with their far-famed white winter broccoli. In these days Rhubarb would find a ready market in every town in the kingdom, and there would be no fear of producing too much, provided it could be sold cheap enough. As manure is a principal item in its culture, the supply of this must be duly considered, before the locality is fixed on where it is to be grown, which should be fields contiguous to some line of railway. Being one of the grossest feeders of any vegetable we have, Rhubarb should have plenty of manure; and just in proportion as the latter is well or ill supplied, will the crop be abundant or scanty. The very strongest manures, as cow dung, night soil, horse dung, or sewerage water, suits it perfectly. In the latter might be soaked Irish peat charcoal, which has the power of absorbing a large quantity of water readily, and every thing grows well in it.

My plan is to form large plantations of Rhubarb along the sides of some railway in Cornwall or Devon, and, as in the case of sea-kale and asparagus, if practicable, ground should be chosen for it that slopes to the south, for this will make a difference of at least ten days in its earliness. When the land has been selected, dung it heavily, and trench it at least two spits deep. This should be done before the heavy rains of winter set in. Soil of too stiff or too clayey a nature must be avoided, for that would make a difference in the earliness. For the same reason, wet land should not be selected, for that is at all times 5° colder than well drained land: besides, the latter offers facilities for air reaching the roots which wet land does not, and without air, the roots cannot thrive any more than the tops can.

Before making the permanent plantation, it would be well if a large number of the best sorts were previously planted out thickly in a piece of ground, and coming forward; these might be divided and increased with advantage, leaving a bud on each division. This will multiply your stock amazingly, and lessen your outlay for plants. Mr. Myatt plants 4 feet square, but that is quite a foot too wide for field culture, if no other intermediate crop is intended. The plants ought to be put in alternately, or quincunx fashion, which gives them more air, and the roots fair play. In the first year, something dwarf might be sown between the rows, as turnips for instance. Next year the Rhubarb plants will afford a fair picking, and in doing this some leave nothing but the flower stems to draw up the sap, until the last pulling takes place, and then the flower stems are removed; but Mr. Myatt makes it a rule never to pull every stalk off; for that injures the root. It is quite certain that leaves and flower stems are in a great measure formed out of the matter that was stored up in the roots the previous year; and if we cut them off without allowing them to restore to the root that which they have taken from it, we shall have a weaker growth the following year. It is on this principle that the leaves of crocuses and snow drops are never removed by good Gardeners, till they have fulfilled their office, and become withered; for if they were, the result would

in all probability be no flower next year. Rhubarb roots should therefore never be perfectly denuded of foliage.

I mentioned to a London Market Gardener, one day that I was of opinion that Cornwall and Devon would ultimately be found to be the great marts for our early Rhubarb. His reply was, "We can beat them hollow." "That's well," said I; for the whole of the north of England and Scotland too are ready to receive not only early Rhubarb, but every thing else. At the present time (April 25th) there are many tons being sent northwards daily. There is no fear therefore of glutting the market. The Cornwall and Devonshire growers might easily have forced Rhubarb all the winter, by making trenches five feet broad, and one or two hundred yards long, taking up the roots and packing them in the trench, and putting mould upon them. Hurdles covered with straw might be placed over all. Nothing more would be needed; but of course it would require immense quantities of roots to replace those that were forced, which should not be thrown away, but cut into eyes and planted again. In order, however to save the roots where they stand, and still get them earlier, they must be covered with pots, which must be made for the purpose, not less than 18 inches high and a foot in diameter. They should have no hole at the top, as that would not only let out the heated air generated in the inside by the sun's rays, but would cause the interior to be colder than the external atmosphere. To avoid the expense of pots, covering the crowns with plenty of straw is a good plan, to protect it, the straw would afterwards act as a manure to the ground. Many persons prefer Rhubarb grown in a half blanched form, they think it more delicate in flavour: one thing is certain, that it does not form so large leaves, and would be easier packed. The mild climate of Cornwall and Devon would however, without any artificial treatment, produce Rhubarb fit for use at least five or six weeks before it could be brought to market from anywhere else; and instead of having five or six weeks' cheap Rhubarb, as we now have, we should then have a two or three months' excellent supply. It is now (March 10) sell-

ing at 1s. a bunch of from twelve to eighteen heads, which, trifling as it may appear, is such a price that the middle and industrial classes cannot pay.

Ireland, which has the finest land and climate in the world, and which has railways passing from its south to its north, possesses extraordinary capabilities for producing every thing in first rate style. The south could supply the north with early produce; the north again could supply the south with late produce, and in this way a long continuance of good and cheap things would be the result. But when shall these things be? When shall that unbappy portion of the British dominions care for its own and its neighbour's interest? Let us hope that it soon will, that the dark cloud which at present hangs over it will pass rapidly away, and ere long fair "Erin" will put on a bright and a more industrious and smiling face.

VEGETABLE MARROW.

AFTER two winters' trial of ripe Vegetable Marrow as food, having used it with all sorts of meat, I can confidently recommend it as a first rate winter vegetable. Many object to eat it in a ripe state, and it may be many years before it receives universal acceptance as a winter vegetable, but in this it only shares the fate of many other things now common on our dinner tables. The Potato past through the same ordeal; many a weary day did this valuable tuber struggle for a place. With almost, if not quite as many good qualities as the potato, the Marrow is not so liable to so many diseases, and it is much easier to cultivate. Since I have recommended its use in a ripe state to public favour, I have had letters from gentlemen who have been in every part of the globe, and they state that in some places hardly any winter vegetable could be obtained but ripe Marrows. Sir Henry Bethune informs me, that when in Persia, fifteen years ago, Marrows or Gourds were his greatest favourites, but he never could get them into use at home. I have ripened the Marrow upon the flat

surface of the ground for these two years past, as well as on iron rods, up sticks, over hurdles, against walls, and over arbours, which it shades agreeably. Indeed it may be grown in any place, and anywhere in the United Kingdom. It might be cultivated in Ireland with advantage; and till the people throw off their prejudices, pigs could be fed on it. They thrive fast upon it boiled and mixed with middlings, or other spare food. The seed should be sown near London, about the first of April, in any warm corner; northwards, a little later would answer better. When up, plant out amongst potatoes or other vegetables that are soon to be removed. As soon as it comes into bearing the fruit must be cut off regularly; the plants should not be allowed to bear the main crop until they are very strong. While they are acquiring strength the young Marrows could be used for table, as well as for mixing with pigs' food. The Vegetable Marrow likes a rich soil, and if it can be watered with rich manure water now and then, so much the better as to its keeping properties; of course much will depend upon its ripeness. When thoroughly ripe the skin is very hard; if a pin pierces the skin freely it is not quite ripe. I have grown two sorts, a yellow and a green striped with yellow; both are well-flavoured and productive, but I prefer the green one. When ripe they must be stored in a dry place, from which frost is excluded. The under ripened ones should be used first. In boiling ripe Marrows cut them up into pieces of four or five inches in length; take out the pith and seeds, but do not remove the skin before boiling; then boil in plenty of water with a little salt; after three quarters of an hour's sharp boiling (this depends upon its ripeness) let the pulp be scraped out into a dish, and press out all the water that it has imbibed during the process of boiling; add pepper and salt, and mash as with turnips: and no one who has not tried it can have any idea what a fine winter dish it makes. To captains going long voyages it would prove most valuable. Vegetable Marrow in its young state makes a famous pickle. Cut it into two or three inches in length, as cucumbers are served. I have several ripe ones now (April 15) quite sound, and

their flavour is quite as good, if not better than it was in the beginning of the winter; with a little sugar it makes a good dish for children; and where apples are scarce, good sauce for pork and geese, with a squeeze of Lemon in it; but always bear in mind that vegetables are made indigestible by too little boiling.

THE SCARLET RUNNER.

IN November of the year 1830, when I was at Lord Canterbury's, I saved a number of roots of Scarlet Runner, and stored them in moderately damp mould away from frost. These same roots were planted out in single rows, one foot asunder, some time in March or early in April, the crowns being placed half an inch below the surface. Beans (Scarlet Runners) were sown in rows at the same time. The transplanted roots came into bearing just one month before the sown seed. This afforded me a lesson which I did not forget; I have had several roots three years old, but one in particular I grew for seven years, and this one I exhibited at the May show at Chiswick in 1834. Many were surprised to see a Scarlet Runner ten feet high full of flowers and Beans, the produce of a plant forced in a Vinery. From this little experiment, I would infer that if cottagers save their roots in autumn, and put them carefully by, they would have this valuable vegetable a month earlier on their tables than they now do. Another way of saving the roots is to leave them in the ground all winter; but this plan is not to be recommended, the plants will have exhausted the ground very much during the summer, therefore they should be replanted in fresh ground. I should mention here that if fine roots are wished for in autumn, care should be taken not to allow many seed pods to ripen, as the ripening process robs the roots of much of the returning and elaborated sap. I find another point worth recording with respect to dwarf French Beans. A few plants not wanted for potting were by chance placed out in a corner; this was in the beginning of April; they

had been nearly killed by frost and red spider, &c.; ground was prepared for them on a south border, the plants before planting were dipped in strong brimstone water, in case any spider should be alive on them; two rows were planted, and two rows were sown with the early Dun Beans, the transplanted ones looked badly for a fortnight or so, but almost as soon as they began to grow they showed blossom, and came into bearing three weeks before those from seed. This was in a warm garden on the banks of the Thames belonging to the under Secretary of War. [Care must be taken that these roots are not eaten. They are poisonous.]

THE STRAWBERRY.

THE cultivation of Strawberries, whether under glass or in the open ground, requires much more attention than is generally given to it.

The great secret with pot plants is to get them strong and well rooted before winter. Where only a small number are grown, the following is undoubtedly the best plan of proceeding. Take pots eight inches deep, place an oyster shell in the bottom of each, and on this put a good handful of soot; then fill up the pots with a compost, consisting of half strong loam, and half light rich mould. The mixture of mould ought to be moderately dry, for if wet mould be put into the pots, it is very often the cause why plants do not thrive; and more particularly when in bloom they often go blind; but if the mould be dry when put into the pots, it does not swell to any injurious extent. Carry the pots to the Strawberry runners, and place one in the centre of each pot, and have a basket of small stones at hand so that one may be ready to lay upon each runner, just behind the plant, in order to keep it steady until it has taken root. I do not follow this plan myself because I have such a large number (4,000) of pots. I prepare them as before, and plunge them all to the brim in a piece of vacant ground; then on the first dull day I cut off the runners, merely removing the strings, and

by no means cutting the roots or the tops, for both are injurious to the young plants.

For the British Queen, I have found the following the best method of cultivation. Plant the runners out in beds, four inches apart each way, and in the spring cut off all the blossoms. Take them up in August, and remove a few of the upper leaves to induce the plants to form top roots. The winter treatment is of great consequence. I never allow a drop of water from November, and from being kept quite dry, nearly all the large leaves die off. During this time, they may be kept under glass in pits, or stacked up on their sides against a wall out of doors. I always plunge the pots to the brim in the pits, for the plants do much better there, than standing on the surface of the mould, and the pots ought never to be less than a foot from the glass.

When brought in to be forced, a very low heat must be applied, and only increased at the rate of about 3° weekly. As a confirmation of my views about this, I shall take the liberty to quote an article by Dr. Lindley in the "Gardeners' Chronicle" of April 10, 1847, which every Strawberry grower ought to get by heart.

"Those who would understand the philosophy of Strawberry forcing should begin at the beginning, and first determine what it is they have to deal with. This can only be ascertained by examining the young flower buds as they exist in the plant when it makes its first move towards growth. At that time they are collections of tiny scales placed over a small spongy centre. By degrees they take on the forms of calyx, corolla, stamens, and pistil. They form successively in the order in which they are named, the calyx first, the pistil last. The calyx and corolla are the most simple, grow the quickest, and most easily bear to be hastened; stamens require more time for growth, the pistil most of all. When high temperature, night and day, with abundance of moisture, and as much light as February yields, are suddenly applied to the Strawberry, it is compelled to grow; the predetermined parts advance, and obedient to the influences which their nature cannot disregard, they by degrees unfold; but how? The oldest

parts, namely the calyx and corolla, simple in structure, and already advanced in their formation, suffer no injury, but appear in their usual state, arraying the blossom in gay apparel of white and green. The next however, the stamens, having less time to form, acquire perhaps their yellow colour, but are powerless for their allotted office; while the pistil, the most complicated of all the parts, that which demands the longest period for its perfect formation, but which is the latest that the flower produces, and which is to become the fruit, is a mere tuft of abortions, incapable of quickening, and shrivelling into pitch-black threads as soon as it is fully in contact with the air."

When plenty of air is given at all times, Strawberries will set in a heat of 70° while if kept without or under such a temperature, many flowers will be more or less blind, and those which ripen are badly formed fruit.

I have raised large crops from plants that have never been in pots at all, on a plan which I described in "Loudon's Magazine," in 1837. The plants were Keen's seedlings; the runners were taken off as soon as they had rooted well, planted in a bed of prepared mould, and attended to with water during autumn. Towards February, they were taken up, with good balls, and planted eight or ten inches apart each way, in a frame or pit. They were then brought on gradually, and strange to say, after they have set, they thrive well within a bottom heat fit for the cucumber. It was astonishing to see how fast the fruit swelled when kept moist. The pits (at Dyrham Park), held each 150 plants, and the plants produced double the quantity of fruit that could be grown in pots. I have since often practised this plan with excellent results.

After the crops have been gathered, the pots are taken out of the houses or pits, and the plants are either planted out in the open ground at once, or kept till the ground becomes vacant, for the next year's crop, and for the runners for the present year's potting. The plants turned out, invariably bear an excellent crop the second year, and after this is gathered, I destroy them; this plan I have practised for fifteen years. No doubt they would bear a third year, but not to remunerate me

while I stand at a rent of £35 per annum for one acre of ground with a small cottage.

From single plants, both of the British Queen and Keen's Seedling, treated in the above manner, I have taken 2s. 6d. selling them in pottles weighing each 12-oz., from the open ground. With this fact before them, people will scarcely adhere to the old plan of beds all huddled together, where the plants get no sun, no air, and are full of snails, slugs, wire-worms, &c., give a small stunted crop one year, and none at all the next. It will be almost needless for me to mention sorts. Mr. Myatt, of Deptford, has done more in improving the Strawberry than all the world beside, by hybridising and raising seedlings; no one can doubt this who has seen a British Queen.

The Black Prince is one of the most prolific kinds, and is very early. I have had it in my possession for three years, and have exhibited plants with two hundred fruit upon them; these plants were three years old. It is a fruit of medium size, very dark, full flavoured, and a first-rate sort for preserving. I think it will become a general favourite. By accident, I discovered an excellent plan for producing a late crop. I turned out about three hundred pot plants, in full flower, during the very hot weather in April; a severe frost about the first of May destroyed all the bloom, and now at the end of June the plants are showing abundance of blossom, which no doubt will give a good crop by and by. They are planted in the open ground.

Soils make a wonderful difference in Strawberries; the very best is a sandy loam. In this they will not grow more to root and top than is necessary for the formation of good buds for the next year, while in a rich light mould, if the autumn prove wet, they will produce a large watery mass of tops, growing on to the middle of October, and producing no buds in the centre.

I have practised the following plans on light soils. Where the Strawberries were planted out in poor sandy soil, I have obtained a famous crop by giving plenty of liquid manure in the spring. A similar result followed when, before planting out the runners, I have taken out a spit of mould, and put in its place a spitful of loam,

and then planted the runners in this. I have also planted the runners in small pots filled with loam, and about the first of November planted them out for the next year's crop. I may state here, that I never put more than one plant in a pot eight inches deep, and in planting out of these for the next year's crop, they are put a foot apart in the row, the rows being two feet asunder. Care should be taken not to save any runners from plants that have not borne well; all those that do not, should be pulled up at once. The Strawberry is very liable to deterioration from neglect of this point, the plants becoming unfruitful from an excessive luxuriance of growth, particularly in light land.

Where persons do not force, it is a good plan to trench the ground well, and plant the runners a foot apart each way. By this means a good crop will be insured for the first year, and after this has been gathered, every second row should be cut away with the spade, leaving the others for the second year; after this, they should be destroyed as soon as they have produced enough runners for a new plantation. For many years I have mulched between the rows with fresh stable manure, about an inch thick all over the ground, just as the Strawberries were coming into flower. If the weather be dry, water should be given several times; this carries the strength of the manure down among the roots, and by the time the fruit begins to ripen, the straw will be quite clean and free from smell. It then forms an excellent safeguard against heavy rain dashing grit over the fruit, a thing above all, to be guarded against. I have found this plan much better than that of using clean straw or short grass, but if plenty of liquid manure can be had, the case would be altered. If I had a pipe of the London manure water which Mr. Smith of Deanston is about to carry to the districts west of London, I should use it pretty freely.

This year Mr. Braithwaite of Weymouth, sent me a cask of schist, a bituminous earth, and I tried it and found the effect excellent upon young cucumbers, melons, potatoes, strawberries, and indeed, upon plants in general.

In conclusion, I may add, that the runners from pot plants always bear a week earlier than those that have never been in pots.

I have tried various plans of hastening the ripening of fruit out of doors; such as slates, tiles, stones, &c. These plans have their faults, they afford harbour for insects to breed below them; I have generally found that the hot sun acting upon these materials ripens the fruit prematurely, and consequently it is acid; this may do for the market, but not for private use. The manure fresh from the stables, mixed with straw, is a non-conductor of heat, and under such circumstances, the fruit ripens naturally; the frequent rains or waterings carry the strength of the manure amongst the roots when most wanted; by the time the fruit is ripe, the mulching is quite clean; the decaying manure, after the crop is gathered, nourishes and restores the energies of the old plants, as well as nourishes the young runners intended for another year's crop. To put this mulching system to the test, I allowed all the Black Prince runners that were made last autumn to fill up between the old ones; this year, the crop from this piece was immense. The old plants in the winter were rooted out, in order to make paths or alleys; the alleys again were well manured, and the runners allowed to stand. This system is very easy, and would always give a sure crop, though the fruit would not be so highly flavoured as that from plants standing singly; but to give this one-year-alternate-bed system a better chance, it would be best to plant the rows in the first place three feet apart, and to make up for the loss of ground the first year, the plants in the row may be placed four or five inches apart.

In dry seasons, the Strawberry requires an immense deal of water, avoiding dashing the water over the blossoms; and if dry till the end of the crop, continue watering twice a week. By attending to this, the Black Prince was as good at the end of this hot season as at the first; if the watering had been neglected, it would not have been worth gathering towards the end, and the fruit would not have been near so well flavoured.

Such is my treatment to this most delicious fruit, so universally grown and liked, but which, I believe I should be justified in saying has been more roughly treated than any other plant, except perhaps, the potato; and this too in places where better things might have

been expected. Only last year, persons were advocating in the *Gardener's Chronicle*, the barbarous system of mowing down the leaves, the consequence of which is a new growth of the plant, too late in the autumn to form buds for the next year's crop, not to speak of the drain on the system of the plants.

Such a proceeding must be the result of experimenting without thought or purpose, and it would be much better to leave Nature alone, than interfere in such a way.

Sound cultivation can only be founded on observation of the natural tendencies of plants, so that by artificial means, we may favour their unfolding in the particular direction we require. Thus we lead nature to furnish us with products which, under common conditions, are not developed, and this without injury to the plants, but all attempts to *force* the production of particular results, in opposition to natural tendencies, must either fail, or be accompanied with the destruction of the health of the subject.

THE MELON.

IN the first place, the seed box ought to be set upon four inch brick-work, all round, with no holes, the inside filled up with fagots; put six or eight inches of dry leaves, with a little dry mould to finish; the linings can be fetched from the stable yard, and put direct to the pit, finishing with a foot of leaves upon the top; when the seeds are sown, they ought to be sown in a pan, which is generally used under strawberry pots in the forcing houses; the reason for which is, the roots strike direct to the bottom, which makes them much more fibrous rooted than if sown in a deep pot; the soil should be half loam, the other half leaf, or any light mould; the heat of the bed must never go below seventy, nor rise above eighty degrees, with an inch of air night or day; no covering, unless very bad weather; when the seed leaves separate, it is time to pot them; the pots used are sixties, or five inch pots, with two plants in each; the drainage ought to be horse-droppings,

dried on purpose; the mould must also be very dry, to allow of a little water to settle the roots; the roots ought only to be covered, and filled up by degrees afterwards; the usual practice is to fill up with mould at once, and next morning we find the plants drawn, and half spoiled, by the heat of the mould and watering together; when water is required keep a little very dry mould in the frame, and put some on the surface of the pot about an hour after watering; that is the only preventative against damps. In setting the plants in the frame, they ought to range east and west, and if possible, to change their position right round every day. If your seed-bed stands exposed, you might put up a screen of matting to keep off the cold north winds, but never allow your covering to lap too far over—to keep out the cold as people suppose—for heated air will always prevent cold from entering. If the above directions have been properly attended to, plants will be ready to put out in five weeks. I am speaking of Melons sown the first of February: I also consider half the labour and care are over when the plants are moved from the seed-box. Take great care of an infant the first year, and its constitution will be sound, and its legs straight for ever afterwards—the same with a vegetable; all the skill a man can possess will not make a plant productive, if not well attended to, when very young. Now for the planting out. Your plants have by this time been once stopped, say 5th of March, and the pit or frame got quite ready, the hills ought to be fifteen or eighteen inches from the glass; the plants thrive much better on account of the great body of air; the first hills ought to be one foot high, composed of half loam, the other half leaf or any light mould; no dung mixed with the hills. In planting out, let one plant take the back, the other the front of the pit or frame; watering depends upon the state of the things at the time. In the course of a short time, they will want a second stopping. As the roots appear lead them down the hills by covering them with a little mould, adding at the same time about two inches of mould over the surface of the bed, and as the roots cross the bed, when any make their appearance they

must be covered with mould, kept in pots in the pit on purpose, and continue doing so until the fruit be all set; but after that time, they must not be disturbed, neither must you over-mould the bed. When finished, the hills ought to be four inches higher than the surrounding mould; six or eight inches I consider is quite enough for very early Melons. I allow three or four runners from each plant, and when they grow within six or eight inches of the frames I stop them. They in a few days put out their side shoots with fruit in abundance. Stop them one joint beyond the fruit upon each plant. If one or two be wanted very early, cover the fruit with sand or dry mould. After it gets the size of a walnut, you may plunge a glass, if you want to know the heat; you will find the fruit swelling rapidly in a bottom heat of about ninety, at fifteen degrees more than you dare keep the atmosphere of the pit at. I syringe a great deal over head, and round the flues with deluted dung water; but as soon as I see the Melons are nearly full grown, water is withheld altogether; but in watering, I never allow any to touch the centre of the plant. I may state, also, that I am not a great advocate for much dung with the mould, neither do I like mould over stiff, neither do I allow the mould to be trodden like a highway. I always keep a toad in the frames from the very beginning to eat the wood-lice. By strictly adhering to the above, I have cut Melons four years, from the 5th to the 10th of May. I have also set fruit on the 5th of April, and cut the Melons upon the 5th of May.

I was the first that ever had a medal from the Horticultural Society on the 10th of May, 1837, until the show days were altered to the end of May.

Although it is several years since the above was written, I have but little to add to it. I may mention, in conclusion, that I have cut seventy-two melons out of a twelve light pit, and all sold in Covent Garden by the 10th of May, the sort was Cuthill's Early Scarlet Flesh, by far the hardiest and best for an amateur, and the only one now grown for the first crops for Covent Garden. This Melon gained a prize at Chiswick, and one at the Regent's Park, last year.

THE CUCUMBER.

My seed pit is built of solid 4-inch brick-work laid in cement; it holds 200 4-inch pots, and has two lights; but of course, the size should be in proportion to the demand. The laps of the glass are all filled up, and painted with anti-corrosive paint, which is cheaper and lasts much longer than any other paint; no putty is employed, except in the bedding of the squares, they are merely painted, and no drip ever enters the pit. The pit is bottomed with a few rough boards, and over these about three inches in depth of mould is put, on which to set the pots level. The dung is applied fresh from the stable-yard, making a very substantial lining about $2\frac{1}{2}$ feet in width at the bottom.

As soon as the pit has become sufficiently heated, the seed is put into a pan of water, in which it is allowed to steep for 24 hours; after which it is sown in pans of two-inches deep, in dark-coloured mould of a light nature, fresh from a pasture which has been under grass for many years. As soon as the plants are up, and the seed leaves separated, they are potted off into 4-inch pots, using the same mould as before, with a bit of turf for drainage. Two plants are put into each pot, placing the plants in the pit east and west, and no water is given for three or four days, in order to prevent the tender stems from damping off. Air is given day and night, both back and front, and the heat is kept up at night to 65° and by day to 70° . The plants are shifted right round every three or four days, and they are watered when required with soft tepid water.

As the plants only remain in the nursery bed for about three weeks, the large pits should be prepared for their reception by the expiration of that time. This is effected by lime-washing their insides, hunting out all woodlice, and by covering the pipes which traverse the middle of each pit at the bottom for bottom heat with a layer of oak fagots, putting some rough dung or straw over the sticks to keep the mould from mixing with the fagots. The mould rough from the fields is put in, so as to form a ridge in the centre of the pit to the dept'

of at least 16 inches, leaving the top of the mould about two feet from the trellis. The fire is lighted at least six days before the plants are put out, there being four dozen lights to one fire, and consequently much cold water and mould to heat. As soon as the mould is heated through, the plants are planted out, immediately under the centre of each light, inserting them in the mould up to the seed leaf, and placing a stick to each plant reaching the trellis. The latter is formed by a strong stick under each rafter, and by hazel rods about four feet long, placed five or six inches apart. As soon as the plants reach the trellis, their heads are nipped off. Saddles on the pipes made of zinc are kept full of water, and the plants are frequently watered with diluted dung water in a tepid state. Plenty of air is given, and the heat is kept up by day to 70° and by night to 65°. The shoot is pinched off at the fruit, and not at the joint above the fruit, as is the practice with many, and by this mode the frame does not get so full of useless vines. Keep the male blossoms cleared off at all times, and after the plants come into hard bearing, every encouragement must be given them, administering manure water freely. A copper of heated water is required, for when the forced strawberries are off, we have 100 lights, which require a great deal of tepid water up to the middle of June.

Our plants are generally in September just as healthy as ever, even after cutting three times a week all the summer, and then ripening the seed. We have cut on the 15th of April out of forty-eight lights, seventy cucumbers at one cutting, averaging in length from twelve to sixteen inches, and in April this year I cut three hundred and twenty altogether. The quantity of water used during bright sunshine with the plants in full bearing, is about four gallons a week to each light, and this is always applied by sprinkling every day over head, at half-past three or about that time, and then of course the lights are shut down close. The water used is diluted manure water obtained in the following manner.—Water is thrown upon the fresh dung from the stables, and a tank being at hand the water drains off and carries in solution the strength of the dung. I mix one

gallon of this with three of water that has been exposed to the sun. I never in the height of summer water with cold water, for I am persuaded that half the diseases in cucumbers arise from watering with cold water from tanks not sufficiently open to the sun and air.

The admission of air is also a matter of paramount importance. I never give air at the front of the pits, for this reason, that the moment you admit air in front and back a dry hot current is produced, which in cucumber growing above all things should be avoided; but if air be given at back only, a circulation of heated air something after that under the Polmaise system will be maintained. And be it remembered, the older your plants, the stronger heat they require. Shading is of course necessary in the first instance, until the plants gather sufficient strength, but it is only half-starved, diseased and badly-rooted plants that require, shading all the summer. To preserve them from woodlice, keep four or five toads in each pit, and after the plants have reached the trellises, the young woodlice among the leaves may be caught by placing small pots full of hay on a ledge under each light. These I examine every day, and find by this means that the woodlice are very much reduced in number. I have paid six shillings a dozen for toads, which shows the value I place upon these commonly despised but really useful animals.

I have bought all the new cucumbers advertised, but I may without fear of contradiction say, that I have never found one so early and so productive as my Black Spine. I have now had it in my possession upwards of fifteen years; it took prizes at Ipswich in 1831, where it obtained first and second prizes at the same show. In 1834 it took the first prize at Chiswick, and in 1836 the first at Barnet. And since then for seven years past it has been the best at the first shows of the Royal South London Floricultural Society.

In conclusion, to grow cucumbers fine and handsome they must be grown upon trellises; the plants will bear better, continue to produce for a much greater length of time, and they will also in this way grow more robust and healthy, a circumstance no doubt due to the great circulation of air which plays constantly around them.

I ought to mention that I use the saddle boiler, of Mr. Hood, of Earl Street, Blackfriars. This small boiler heats with the greatest ease, 400 feet of piping, (200 feet being 3 inch and the rest 4 inch pipes), and is very economical in point of fuel.

THE TOMATO, OR LOVE-APPLE.

THERE are two sorts in use, the yellow and the dark orange or red, but the red is the only one grown for Covent Garden Market, the seed of which is sown round London in March; the seeds are sown in a pot or shallow pan, in moderate light soil, and the seeds covered over about half an inch. The pan is then placed in a hotbed. A melon or cucumber frame or pit is just the heat for it; but the seed would vegetate well if it were placed on a shelf in a stove or hothouse. When the plants are up and about two inches high, prick them into single pots, what we call 60 here, but by measure they are about 4 inches deep, and about 3 inches in diameter. The mould used is generally a mixture of rich loam and manure; the richer, the stronger the plants grow; and being what is generally termed a greedy feeder, it is very fond of liquid manure water. As the plants grow, and the roots fill the pots, shift again into the next sized pots, called here 48, or 6 inches deep. The plants by this time can be put into a much cooler place to gradually harden off. Round London we generally plant them out for good about the first or second week in May, against a south wall, generally between the peach and other trees. They are freely watered. They soon branch out in all directions and as soon as we see a full crop of blossom, we stop or top them. After this, the only thing necessary is not to allow too much, or crowded foliage, as well as to remove all young shoots. If this is not attended to, even in this warm climate, they will not ripen so well. The Love-Apple is in great request in London for sauce. Cooks use it in a great variety of ways. This year (1849) they are very fine and high coloured, and never

were known to be so cheap,—2s. per half sieve, or 6s. per bushel. The price is easily accounted for, as vinegar is used in preserving them; and on account of the disease amongst the people round London, they are not used this season so extensively.

CHICORY AS A WINTER SALAD.

THE wild or uncultivated Chicory is to be seen all over Britain during the months of July and August—the stems rising to two or three feet, branching out with long dandelion-like leaves—the blossom of it is a splendid Prussian-like blue, forming a bright star-like flower, and flowering in clusters; but where the roots are cultivated, and planted in rich earth, the stems will rise to six feet high, and forming a large bushy and splendid flowering plant, and keep in flower a long time, would form no mean ornament in a border or a shrubbery.

The heaviest root I ever grew was three-quarters of a pound, and the length fifteen inches—in fact, as large as a fine stick of horse-radish. The seed of Chicory is not unlike its relative endive, and ought to be sown about the 1st of June round London, if the soil is light and in a warm situation; but should the soil be strong and retentive, it ought to be sown in the middle of May. I found out by experience, if too soon sown, they run to seed, the object being to grow fine, strong, and well elaborated and well stored roots. The ground being well dug, a drill is drawn a foot apart, the seed sown as parsley is, and about the same depth. When the plants are up, thin them out to one foot apart in the rows, leaving if possible the broadest pointed leaved ones. Nothing more is necessary than to keep them clear of weeds. Should any run to seed, pull it up, as it would be useless for any purpose. When they have done growing, some time in November, the crop of roots are all dug up and stored by like beet-root. In cutting off the leaves you must not injure the centre, for out of the centre comes all the salad.

In 1836, I had a quantity of mould put into a cellar,

and planted a bed of Chicory roots as soon as they were taken from where they had grown during the summer. I planted 300 roots in the bed, keeping them four inches apart, light and air entirely excluded. They soon began to grow, producing long, fine cream-coloured leaves, and when about six inches long, I sent them in as salad, cutting off the leaves carefully; for if you cut into the quick, it would stop a second, third, and fourth crop of leaves which a root produces, until the cells of a root are as empty as a honeycomb, or until entirely exhausted. From the number of plants in the cellar, I could have supplied ten such families; but it was not until the severe winter of 1838, that I sufficiently appreciated the use of Chicory as a salad. The frost and snow were severe; all endive, lettuce, celery, &c. was gone rotten. Our salads were the very best in London. Every one that dined enquired what it was, and every one ordered it to be grown afterwards. In consequence of a letter that Loudon published in his Magazine, from me, some fourteen years ago, it was soon grown in the fields for mixing with coffee.

Ten years ago, when I came here, I grew the roots with the view of introducing it as a salad into Covent Garden market. I had it planted into a pit where there was a flue, and covered the glass with mats to exclude the light. I also had five or six roots put into a large-sized pot, and turned the next smaller size reversed over the heads, stopping the hole in the bottom of the top pot to exclude air. This is very easy, and it answers well for a small family, just putting in a few pots in heat anywhere. In the winter of 1839, or early in 1840, I carried in a basket of this fine salad, tied up in sixpenny bundles, at a price which I thought would pay well. No one had ever seen it—no one had heard of it—and no one would buy it; an old herbalist (a Mr. Steptoe) came along; he was a buyer of pure dandelion leaves and all sorts of things for foreigners. He bought all the Chicory leaves, and paid 9s. for it. Thinks I, my fortune's made. Next market morning, I carried a still larger quantity in, but when Mr. Steptoe came past, he merely shook his head, and passed on; when, thinks I, is my first-born child to fall to the

ground like this, and in the first market in the world? When he returned, "Here I have plenty more for you," said I. "'Tis of no use," said he, "I have only sold a few bunches to foreigners." Then I said, "Take the lot this time for nothing." He did so a third time with no better success; then I gave it up. Poor John Bull, thinks I, you despise the finest of all salads, the finest of all tonic bitters, and that too at a fair price; but you do not mind being cheated by paying three and four times more than you ought to do for your Chicory, misnamed Coffee. But I am in hopes even now to see it largely brought into public markets. It sometimes takes many years' hard fighting to persuade people to their own benefit. It just took me three years to establish the *Gardeners' Benevolent Society* of London, which is now one of the most flourishing societies, where the poor broken down gardener gets £16 a year, and should he die, the widow gets £12. Of all other things I have had to do with, of this institution I am the proudest.

In the various places I had lived in previous to my finding out Chicory, I had been continually annoyed, by ladies and gentlemen who had travelled abroad, telling me how much superior their salads were to the English salads. A Scotchman, like me, did not believe them, for we gardeners think no place like our own for good things. Since then, and since free-trade has been introduced, I am of a very different opinion, seeing so many fruits and vegetables coming over, such as pears, plums, apples, grapes, peaches, nectarines, apricots, melons (very bad); strawberries they sent this year, all unripe and quite green, but this helped to frighten us; peas, potatoes, beans, green gooseberries, onions, and many other things. Five shillings for an acre, and a franc a-day to the labourer, is a very different thing from £10 an acre rent, sixteen shillings an acre tithes, taxes tremendous, and labour very high.

I forgot to mention that the flavour of foreign grown roots of Chicory is (to mix with coffee) far superior to English grown, showing, I think, that it is not a native of this country, although wild here now. I also forgot to say that there is a broad-leaved sort in Belgium, twice as broad as our wild one.

LAMB LETTUCE, OR CORN SALAD.

I APPREHEND that the merits of this homely plant are not so well known as they should be. It forms a first-rate ingredient in a salad, and is, I believe, an excellent purifier of the blood. Being a native of Britain it is very hardy, and, if sown in July, August, and September, an excellent succession of it will be kept up during the winter. Then sow again in spring. If a large frame can be spared the best plants might be taken up with balls and planted thickly in it. The cultivator could then have it at command. I have never blanched it, and therefore cannot say whether that would improve it or not. Sow in beds or rows 6 inches apart; thin out afterwards to 6 inches in the row. It will afford many cuttings, if not cut down too closely.

THE LISIANTHUS RUSSELLIANUS.

THE *Lisianthus Russellianus* is a native of Texas, in North America, found bordering on Mexico, growing amongst the brushwood, where the sun hardly ever shone on it, it seldom had more flowers than from six to a dozen, therefore the very climate may teach us how such a plant ought to be treated. Four or five years ago, I printed the necessary directions and treatment, which I now cannot alter nor improve in the least. And I have this year a twelve light pit full of them; and now (July 10) nearly all in full flower, presenting a tremendous multitude of bloom. I have heard of many having this plant very fine for one year or so, and afterwards it completely masters them. I cannot say that I succeeded through any extraordinary care, on the contrary, I think by giving it too much attention, and changing it about from shelf to shelf during winter, you kill it. These last two winters, I have placed the pots in pans and put them on a shelf within one foot of the glass in a house where the camellias are; they are not moved nor touched, not even to displace a dead leaf,

during the whole of the winter, from the 1st of Sept. till February, just keeping them moist enough to keep them from flagging; never watering on the surface, but always in the pans. In February they are shifted into 8-inch pots; the mixture of mould composed of half rich yellow loam, the other half peat, or bog mould with a little sand; they are then treated as above. They are extremely fond of liquid manure, moderately rich, with a heat of 75, and as the summer advances, they will thrive in 90° well. I know of no plant that takes the attention of the ladies so much as when they see a mass of this flower in the conservatory: there is no flower lasts so long upon a plant, one bloom has lasted 29 days before it faded; this information I had from a lady, who took particular notice. I have up to July, 1848, taken 25 prizes with it since 1840. I have had the honour of serving with seeds and plants every country in Europe and America, but it appears that the Camberwell air suits it so well, that it has made this place its head quarters.

The best time to sow the seed of this most splendid plant, the *Lisianthus Russellianus*, is in March; and as the seed is very small, it requires additional care in sowing; for when sown in the usual way, upon a loose soil, the first watering carries the seed along with it, and hence the failure.

Prepare the following compost—half loam, the other made up with leaf, peat, or bog mould with a little sand; place plenty of drainings in the bottom of a 48 or 32 pot, fill it with the compost very tightly, and on the top place half an inch of sand; damp the sand with water to harden the surface, sow the seed, and sprinkle a very little dry sand on the top; place a propagating glass over the pot, or a piece of glass will do, place your pot in a heat of 70 or 80° with a pan under it for the future watering; at no time water on the top, the pan ought never to be allowed to get dry. The seedlings will appear in three weeks or more; when about three weeks up, plant them singly in a 60 size pot, in the above compost, with plenty of drainings in the bottom; place them again in the back of your cucumber pit or frame, after this you cannot give them too much

water over head and in the pans; and by the autumn, if they have been kept in a good growing heat, they will be fine little bushy plants; top them at every joint; in September shift them into large sixties, merely to keep their roots in a more intermediate state for the winter; after this, all top watering must cease, and a pan placed under each pot to receive the watering; and as the winter approaches, not a drop of water must be allowed to fall upon the plant. The drier the top mould gets next the leaves and stem, the more certain of preserving your plant. The best place I have found is the coldest part of the stove, very near the glass; I have also kept them well in the warmest part of the greenhouse; in all cases, just water sufficient to keep the plants from flagging. If the winter be dry, water once a fortnight; if damp weather, once a month or so; towards the end of February, place them in a cucumber pit or frame, in a heat of from 70 to 75° and when they begin a fresh growth, shift them into as large pots as convenient, remembering the larger the pot, the finer your specimen; my largest plant had 600 blossoms on it, and was grown in a No. 8 sized pot. As the spring advances, it is almost impossible to give them too much heat and moisture; they are very fond of liquid manure.

It is useless to try to grow a fine plant in any place approaching to dry heat, nor less than 70 to 80 degrees. I have grown them 5 inches in seven days.

In removing out of the pits, great care must be taken in not allowing the sun to shine on them for some days, as the change from a damp close heat, to a dry house, will be too much for them. By the above treatment, they will come into flower about the 1st of July, and keep blooming from two to three months, forming a most splendid ornament for the drawing room, conservatory, or green house.

THE TREE MIGNONETTE.

THE *Reseda odorata*, or common sweet Mignonette, treated after the following manner, forms a real treat in the conservatory during the winter and spring months.

Sow in spring a number of small 4-inch pots. When up, clear off all the plants but one in the centre; as it grows train it upwards to a stick until it is a foot high, or two if you please; do not allow any side shoots to grow on the stem, and remove all leaves to within a few inches of its top. When the plant gets as high as you wish it, top it, and then it will throw out side branches; as they advance, pinch off their tops until you have formed a nice bushy head to your plant, and above all things do not allow any bloom to appear until it has become strong, which will be by winter, if it has been well attended to. For the first winter it will be advisable not to have them in larger than 8-inch pots. Mignonette being an annual, if the seeds are not picked off after flowering, it is ten to one that the plant will die. I have had excellent Tree Mignonette three years old—very bushy, and full of flower all winter. Mignonette is often neglected at Midsummer, when our hands are full of other work, and yet this is the very time when Tree Mignonette wants most care, for the flowers not being wanted during summer, ought then to be removed, in order to have a fine winter display. To keep worms from entering and disturbing the roots, add a handful of soot at each shifting over the drainage.

Mignonette delights in sandy loam, not too light, and being a gross feeder, a little diluted manure-water may be given once a week with advantage. If this is contemplated, the mould need not be made so rich in the first instance.

Winter Mignonette, as it is generally called, requires to be treated differently from the above. It is generally sown about the 20th of August, if later it will not acquire sufficient strength by winter for the London Market. I generally grow from eight to ten plants in a 48-sized pot, which is 6 inches deep. For this sowing it is safest to use a light sandy and rather poor mould, for if the latter is too rich and strong the plants damp off during winter. Out of nearly a thousand pots, I have often scarcely lost one by attending to this, by not allowing a drop of rain to fall on them during winter, by never watering them unless they were flagging, and by admitting at all times plenty of air. In the case of frost com-

ing, however, they are closely covered up, sometimes for a week or fortnight together; and if you have not followed the above rules, you will suffer severely from damp. Do not expose your plants for some days after the frost breaks up, and that only by degrees; above all things do not expose them to the sun. My anxiety to give them light, after being so long covered up, has sometimes led me for the moment to forget this, and I have suffered severely for my negligence.

Should the winter prove mild, the plants will root into the ashes they are placed on; therefore they must be lifted up occasionally, to break the roots. Slugs will annoy you if you do not look after them; they fatten on Mignonette. To retard some of the pots, pinch the heads off the plants; by this means they will not flower so strongly as those not pinched, and will yield a succession of bloom.

THE DESTRUCTION OF WOODLICE.

Most gardeners are much annoyed with woodlice. They breed in heat both winter and summer, and they possess an appetite of the most accommodating kind. It matters not whether it is the blossom of a Cucumber or that of a Pine-apple that comes in their way, the fruit of a Melon or that of a Cucumber; they will eat the nauseous leaves of the *Lisianthus Russellianus* with the same relish as they do Mushrooms, Carrots, Parsnips, Beet-roots, Scorzonera, and Salsify; they like for their salad Chicory leaves, which are not a bit too bitter for them. I have lost many an ounce of Strawberries through their depredations, and also many an early Cucumber that would have brought me 3s. 6d. in the market. The means I have employed for their destruction have been toads, which are effectual; but they are expensive, being 4s. a dozen. Many of them die, and except they are kept in quantity, the woodlice cannot be kept down. I have also tried pots with hay in them, Carrots, sliced Turnips, Cabbage leaves, bread, poisoned ditto, poisoned Turnips, and boiling water when it

could be used. As to the time for destroying them, we all know that if we kill a wasp in spring thousands are at once destroyed. It appears, then, that the best time to kill woodlice is towards August, when they have ceased breeding, and are spread all over the grounds; attack them then before they return to their winter quarters, to which they repair with alacrity when roused. I once formed a Mushroom bed parallel with an old deal fence; but, as might have been anticipated, I did not gather a single Mushroom; every time the bed was uncovered the woodlice made over the ridge for the fence with great speed.

My object now, however, is to state that from some trials I have made, I am convinced that woodlice may be killed by the use of bantam fowls. This plan may be put in operation by any one, even as this time (Dec.) of the year. I first had a hundred woodlice caught at a rubbish heap, and gave them to three bantams; they ate them up in something less than two minutes. I had these birds in attendance when turning over a rubbish heap, and not a woodlouse was allowed to escape, nor any insect, the bantams devouring everything. It will thus be seen that if bantams were encouraged and brought up in gardens, they would effect much good; and I am of opinion that it will soon be found to be as necessary to keep bantams to kill vermin, as it is to keep cats to keep down rats and mice. They will save various crops from injuries to which otherwise they would be exposed. They would scratch a little, to be sure, but so do cats, and if the smaller kind of bantams are kept (those about the size of a partridge) their scratching would do little harm. Perhaps some plan might be found to envelope their feet in socks at certain times of the year. The reason why gardens are generally nurseries for all sorts of insects is, because they are guarded by cats, traps, nets, &c., in such a manner that no bird can approach them. If it were not for the wild birds of the fields, the farmers' crops would be eaten up with vermin; and I think that birds have as much right to a little of the fruits of this earth as we have, for helping to keep destructive insects in check. It will be the gardeners' own fault in future if he is much troubled with woodlice.

The above was written last December. This spring I had a temporary cage placed at the end of a twelve-light cucumber pit; a brick was driven out in order to allow the ingress and egress of a large brood of bantams. I had those for this experiment from a fancier of the name of Dawson; they ate up every insect in less than a week. Another year, I intend to have a hole in all the pits, and move the young bantams from one pit to the others. I have a rubbish corner where all the rakings, leaves, and general refuse of the garden are put. This place is enclosed with 4-foot lathes all round, and a brood of bantams was put there. This was at one time the grand breeding place for all sorts of insects; but now it is the most valuable corner which I have. The moment an insect comes to the surface, it is eaten up. I have had three full-grown bantams at large nearly all the summer (Sir John Seabright's Silver Spangled), and to see those birds with their hawk's eyes, walking about through the sheds, houses, mushroom places, up and down the alleys of the pits, &c. picking up every crawling insect, is very satisfactory. One bantam is worth fifty toads. I do not mean to say that in a general kitchen garden, it would do for them to be at large at certain seasons; but even then I should make them quite welcome to a few cabbage or lettuce leaves, for the great benefit that is to be derived from their destroying every sort of insect, except the slug and snail, which a few young ducks in the autumn and spring would soon remove.

TO DESTROY THE GREEN FLY.

I HAVE used garden-pots for this purpose for these 10 years. The *modus operandi* is to put a quantity of coke, coal, or short pieces of wood made red hot at the bottom of the pot, and then on these the tobacco paper. That which I use is picked into small pieces before it is put on the hot cinders. The pot is then placed where it is wanted, and the embers blown with a pair of bellows, whose nose is introduced through a hole in the side of the pot near its bottom. I now recommend the use of a

porridge pot, (in Scotch vernacular)—a tar kettle or plumber's pot (in English). I punch out three holes in its bottom, 1 inch in diameter, and these afford means for a current of air to pass through the fuel. Such an apparatus is easily obtainable, and being cast-iron will last and answer the purpose perfectly for very many years.

PEAT CHARCOAL AS A MANURE.

THE fertilising qualities of Peat Charcoal, even in its plain state, are very great; but when mixed with night-soil, its good properties are of course much increased, and in the latter condition a less quantity is required for an acre. Farmers often fail in raising small seeds, Turnips, for instance; more especially in the south of England. The turnip seeds are sown in a poor hot soil, without any stimulant being immediately available. The seeds in consequence vegetate slowly, giving the fly time to eat the seed-leaf before the rough leaves have been produced. This can only take place in poor soils. On the other hand, Market Gardeners never fail in obtaining excellent crops, however hot the weather may be, a result owing entirely to their land being rich. This fact, therefore, should induce farmers to mix their small seeds with powdered Peat Charcoal before they sow them, all complaints of their failing then would cease. Everything ought to be done that can be done to stimulate your plants. They cannot grow too fast. Farmers, like Gardeners, do not want to occupy the land six months with one crop, if the same can be grown in four. Charred Peat might be used in many ways. It might be employed with advantage in cow-houses, piggeries, and in dung-heaps. When Potatoes are planted, if Charred Peat is used instead of dung, the young crop will have none of those scabby appearances which always occur where dung is used in the furrow; and the latter offers a great harbour for all sorts of insects. The late Mr. Smith, of Deanston, informed me that, in the island of Lewis, he was burning Peat and using the ashes as manure, after the plan which I recommended two years ago. It answers admirably. The farmers of the south of England have no idea what

Peat Moss or Bog is; they imagine that it is simply heath soil, which is a poor, sandy, black mould, generally covering the surface of the ground, not more than 6 or 8 inches deep. On the other hand, I have seen Peat Moss 20 feet deep, and in some places 30; all being one solid black mass. The Irish Amelioration Society ought to manufacture two sizes, one as large as the lump sugar we put into our tea; this size would keep strong clay land opener, warmer, and drier; the lumps of Peat would also retain moisture in the earth longer in hot dry weather, and pieces of this size would be more lasting as a fertiliser. The smaller size would suit light land, and would be serviceable for top dressings. It would be a pity to burn such valuable manure, or it could be easily compressed in a machine and dried; it might then be bought in London readily, and it makes the best of fuel. Powdered Charred Peat might also possibly make the basis of gunpowder quite as well, and perhaps better than wood charcoal. If Mr. Roger's plan of mixing the Charred Peat with night-soil could be carried out on a large scale, it would be much better than allowing the night-soil to be emptied into the common sewers, making them what may be termed elongated cesspools, from whose chimneys or "gully holes" are evolved the most deleterious gases. Peat Charcoal has been proved to be a perfect deodoriser, and mixed with this material our town filth might be carted to the country and made available at once. This is the more necessary, as the hardness of the times will not now allow the farmer to send his wagon and four horses, with a man or two, to fetch home a load of dung, much of the goodness of which has been washed and heated out of it. For my own part, I have for some years used nothing but liquid manure water, salt, soot, and wood ashes, but now I shall employ Charred Peat. All the plants I cultivate grow most luxuriantly in it plain as well as mixed with night-soil. To amateurs I am sure it will prove a boon, as it will do away with the filth and nuisance of dung.

Since writing the above, I have tried all sorts of plants in it, it grows a young plant very fast. It will be famous for Pines instead of sand to mix with the mould, and for a Vinery border for mixing with the

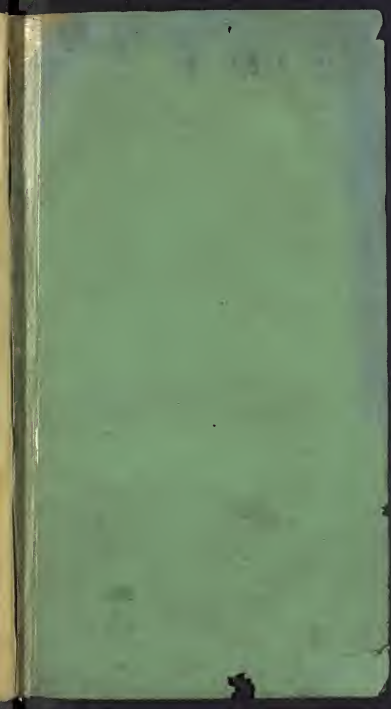
soil, will be first rate, because it will keep the earth porous, and give out its qualities for many years; especially if pieces are used as large as lumps of sugar we put into our tea. And I am quite satisfied that no more sand of any sort, will be used after this excellent Charred Peat Manure is made known.

POSTSCRIPT TO THE POTATO.

I HAVE this day (August 14) taken up my late experimental Potatoes, consisting of a late White Kidney, a late Pink Kidney, and the Regents, as well as the transplanted ones before-mentioned. They covered five rods of ground; the rows that were cut down on the 27th July, lost in weight about 12-lbs. to the forty plants, and were not so mealy nor fine flavoured, compared with those that were not cut down. The transplanted 'shoots had from three to six fine Potatoes, and had only been transplanted about eleven weeks. These experiments go to prove what good wintering of the tubers will do; no manure was used, only a handfull of charred peat over each tuber when planted out in February. I offered 2d. for every diseased Potato, but none were found.

The last experiment I have to record, was that of putting a one-light frame over a piece of Potatoes which had not been cut down; this was upon July 27th. The light was put on, and the halm watered *morning and evening* for about ten days. The light was taken off when the sun came out, and the next day the *real disease* showed itself on the underside of the leaf in the form of a white mildew; and when the sun came out strong again, this white mildew disappeared instantly, and the leaf turned *quite black* before night. The tubers were taken up on the 14th also, but not one was diseased, no doubt owing to their being nearly ripe. This would seem to point out that the disease is the result of a *concurrence of extremely unfavorable circumstances*. To avoid disease, winter as I do, and plant in February; by these means the halm will contain less water and be more fibrous, and consequently more able to resist disease.

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